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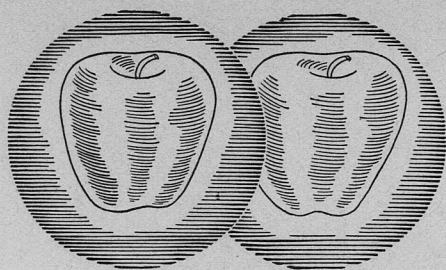
The Maryland Fruit Grower



June, 1934



Maryland State
Horticultural Society



A PRICE STORY ABOUT TWO APPLES

Once upon a time there were two apples. They did not know each other, but they grew up almost side by side.

One apple was on a tree of wise Mr. Smith and the other apple was on a tree owned by Mr. Jones.

Wise Mr. Smith's apple sold on the market for more money than Mr. Jones' apple.

Wise Mr. Smith packed all his apples in Pioneer Myracol Oiled Shreds, and when Mrs. Public saw them so attractively presented and carefully preserved, she realized they were superior and willingly paid more money.

Mrs. Public didn't want Mr. Jones' apple at any price, because it had brown spots on it.

Next year, Mr. Jones is going to pack his apples in Pioneer Myracol Oiled Shreds to protect them against scald and add quality appeal.

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PACKING PRODUCTS FOR FRUIT AND VEGETABLES

The Maryland Fruit Grower

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CONSTRUCTION PLANS FOR HOMEMADE FRUIT WASHING EQUIPMENT

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The following are detailed plans and directions for operating washing equipment of simple design which may be readily constructed by the individual grower. Stray parts of old machinery may often serve conveniently in construction of the homemade paddle washer described.

Hand Dipping

Numerous tests have shown definitely that fruit is satisfactorily cleaned at time of harvest by permitting contact with dilute acid solution for an interval of $1\frac{1}{2}$ to $2\frac{1}{2}$ minutes. The acid bath is used most simply in the hand dipping method. A wooden trough, vat, or old porcelain-lined bath tub may serve for the acid solution and any type of container for the rinse water. Sufficient time should be allowed for direct contact of the acid solution, followed by thorough rinsing with fresh water to remove all traces of acid.

Figure 1 is a self-explanatory construction diagram of dipping tanks which have been found extremely serviceable in hand dipping. The same precautions as to countersinking all bolts or screws and placing of the rods should be observed in construction as are outlined in the following detailed description of the Oregon Homemade Paddle Washer.

It is an additional advantage to provide a dumping table in connection with the dipping tank in order that leaves and decayed fruit, which spread the organisms responsible for decay, may be removed before entering the acid tank.

Operation of the Dipping Tanks

In operating the dipping tanks, the acid bath is filled with water and the proper amount of acid added to wash the variety in question. The fruit is supplied at one end of the acid tank at the rate of approximately five-eighths bushel a minute and is thus gradually propelled toward the drain board and rinse tank. The burlap strips are designed to revolve the fruit in its passage through the acid bath, causing submersion and more complete subjection to the action of the acid. After exposure to the cleaning solution, the fruit is removed in hampers, lifted to the drain board and the excess acid solution permitted to drain back into the acid tank. A $\frac{1}{2}$ or $\frac{5}{8}$ bushel basket with the staves partly removed in order to facilitate drainage has proved a very satisfactory container for removing the fruit from the tanks.

Precautions for Rate of Feeding Apples Into Homemade Washers

Under no circumstances should the fruit be fed into the acid bath of the dipping tanks or homemade paddle washer more rapidly than the prescribed rate, or improper cleaning will result.

When the excess acid solution is drained off, the washed fruit enters the rinsing tank where a constant flow of water is maintained at the rate of approximately 2 gallons of fresh water for each bushel of apples rinsed. The fruit is thoroughly rinsed, and placed on the drain board to remove excess moisture before grading and packing.

It will occasionally be necessary to supply additional acid and water as the

level of the liquid is lowered in the bath in order that the fruit may pass under the burlap strips effectively.

Dipping Pears

Since a large percentage of pears do not float, the fruit is generally washed in baskets, the entire container being submerged in the acid solution and rinse water. The Oregon homemade paddle washer, therefore, though satisfactorily used for cleaning apples is not adapted for cleaning pears unless a different arrangement is used for rinsing. Salt may be added to the acid wash in order to float the pears.

THE HOMEMADE PADDLE WASHER

The homemade paddle washer consists essentially of a long wooden tank constructed of 2 inch by 12 inch lumber and separated into two sections. One portion contains the dilute acid solution and the other the rinse water for the removal of traces of acid. It is essential that the tank, various submergers, and elevators shown in figure 2 be made of wood because of the corrosive action of the acid used in washing the fruit.

All nails and bolts employed in the construction of the washer are counter-sunk and the heads covered with grafting wax, beeswax, or paraffin. Tie rods should be placed on the outside of the tank.

In order to permit sufficient swelling of the boards to prevent leaking, the tanks should not be painted on the interior. The sprocket wheels, chains, and other metal parts with which the acid solution may come in contact are covered with asphalt paint or heavy grease in order to retard corrosion. The use of lead paint should be avoided as it is readily attacked by the acid.

The overflow from the water tank should be maintained at a convenient level to permit the elevator paddles to pick up the floating apples and transfer them without crushing.

Elevator Paddles and Guard Rack

A guard rack, the details of which are shown in the lower right hand corner of figure 2 is used to guide the fruit into the elevators. The rack is constructed of slats permitting the acid or water to drain into the tanks as the fruit is elevated. To reduce the cost of construction, the guard may be formed of heavy battleship linoleum, three to four curved slats being used to hold the proper curve. In this case, the elevator paddles should clear the linoleum by about one-half inch. The linoleum must be replaced occasionally as it is softened from contact with the solutions and unsatisfactory results are obtained.

Submergers

The submergers are used to drive the apples through the washer and at the same time dip the fruit under the surface of the acid. They should rotate in the same direction as the elevator paddles. In the construction of the submergers, 1 inch by 10 inch boards with 6 inch by 6 inch by 3 inch end blocks are used, through which a three-quarter inch or 1 inch pipe axle passes. The bearings may be constructed of hard wood.

Sprockets and Chain

Belts and pulleys on the submergers and elevators are unsatisfactory as they become wet and slip. The size of the sprockets and chains is of little importance. Such parts are often available from old machinery and can be readily substituted.

Towel Wipers

Towel wipers may be formed from strips of burlap hung loosely across

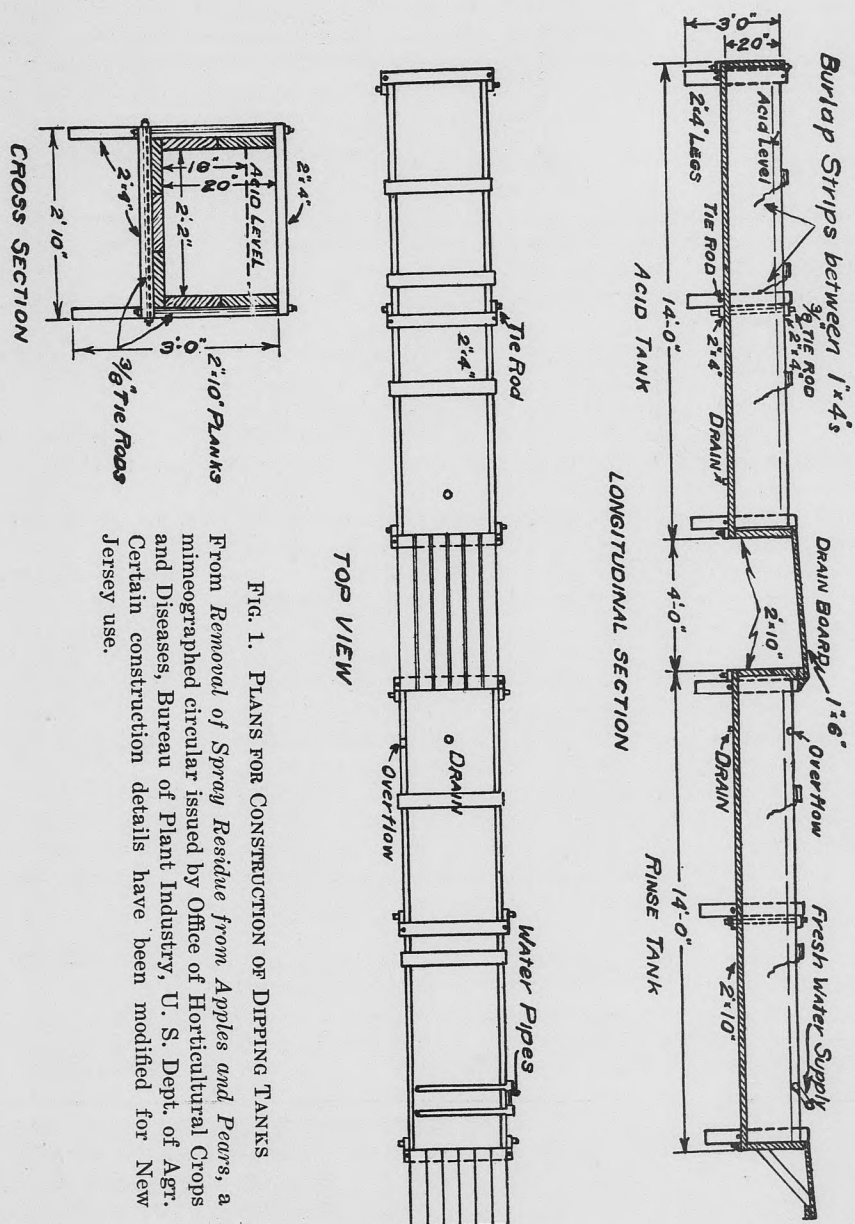


FIG. 1. PLANS FOR CONSTRUCTION OF DIPPING TANKS

From *Removal of Spray Residue from Apples and Pears*, a mimeographed circular issued by Office of Horticultural Crops and Diseases, Bureau of Plant Industry, U. S. Dept. of Agr. Certain construction details have been modified for New Jersey use.

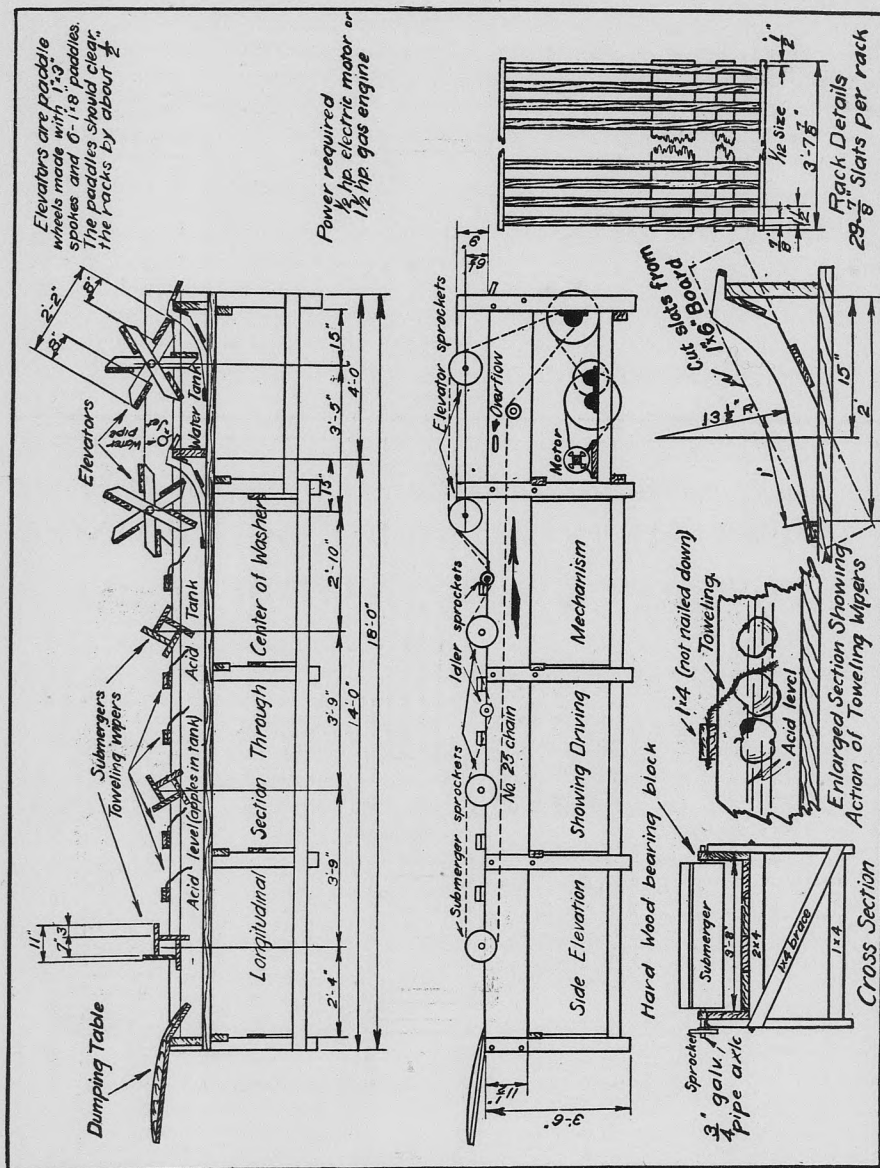


FIG 2. PLANS FOR CONSTRUCTION OF HOMEMADE PADDLE WASHER

From Oregon Agricultural College Experiment Station, mimeographed Circular of Information 15, with some slight changes in dimensions and construction details

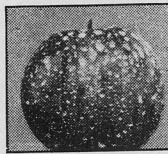
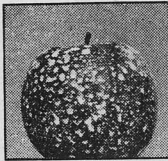
the tank and allowed to dip into the acid solution to a depth of approximately 3 inches. The burlap strips are slit at intervals if there is a tendency to retard the movement of the fruit to too great extent. The object of these cloth strips is simply to prevent the fruit passing too rapidly through the solution and also to rotate the apples gently, thus permitting the acid to come in direct contact with every part of the fruit. The wipers should be fastened loosely in order that they may be replaced easily from time to time.

Dumping Table

Provision is made for a dumping table to aid in the removal of decayed fruit or leaves. If the fruit has been stored in shredded oiled paper it would be well to use a belt and roller conveyor to facilitate the removal of paper before the fruit enters the washer. The pouring of the fruit into the acid tank is likely to cause considerable splashing, in which case the construction of a wooden hood over this portion of the tank may be necessary.

Longer And Better Protection Against Codling Moth HERE'S THE TRUTH ABOUT THE KILLING POWER OF S-W ARSENATE OF LEAD

Lab. No. 1431
Given four sprays of S-W Arsenate of Lead—3 pounds to 100 gallons of water. Total deposit 143 micrograms of unadulterated arsenic oxide per square inch. . . 50% more killing power to the square inch than its sister apple, sprayed with Arsenate of Lead containing an astringent. S-W Arsenate of Lead contains no deflocculator or astringent, insuring the maximum deposit and high toxicity.



Lab. No. 1432
This apple, identical in every respect to the one used in test 1431, was sprayed with an astringent type of Arsenate of Lead stated to contain 93% active in-

gredients and an alum content of 2 1/4% to 3%. Total deposit under identical spraying conditions yielded only 99 micrograms of arsenic oxide per square inch.

S-W Arsenate of Lead contains no cheap ingredient or astringent. It is 98 per cent pure Arsenate of Lead, possessing physical properties that insure a high deposit uniformly distributed. These two apples, selected at random and sprayed under identical laboratory conditions, tell their own story.

There is no substitute for **KILLING POWER** when Codling Moth attacks. And only a hard-hitting, two-fisted Arsenate of lead can stop codling moth larvae.

Before you experiment, remember—it costs no more to use S-W Arsenate of Lead. It costs no more to have its 50% increased deposit unhindered by deflocculators or astringents.

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**AND LEAD ARSENATE
with ORTHO SPREADER**
(and 'Coposil' for Scab and Brooks' Fruit Spot)

Speed of Washer

The submergers and elevators should turn at no more than 4 revolutions per minute or severe crushing of fruit will result. Two revolutions per minute has been found the most satisfactory speed. This speed may be attained by reducing, by means of a series of different sized pulleys with belts, chains, and sprockets, or a gear speed reducer, the rate of the motor or gas engine serving as a source of power.

Use has been made in certain instances of the differential assembly, rear axles, and drive shaft of a discarded auto for reversing the direction of rotation of pulleys and in forming a right-angle hook-up between washer and grader.

Capacity of Washer

The speed of the submergers and elevator paddles does not influence the rate at which the fruit moves through the washer. It is only the rate of feeding the fruit into the washer which determines its period of contact with the wash solution. Therefore a steady rate of feeding should take place.

The following table shows the capacity of the flotation paddle washer with different sized acid tanks.

Data on Homemade Paddle Washer

Dimensions of Acid Tank	Washing Capacity when 2½ minutes' contact of fruit with acid solution is necessary	Washing capacity when 1½ minutes' contact of fruit with acid solution is necessary
	Bushels per hour	Bushels per hour
3' x 11.6' x 11½"	80	130
4' x 11.6' x 11½"	108	180
3' 8" x 14' x 11½"	120	200
5' x 11.6' x 11½"	136	225
6' x 11.6' x 11½"	165	275

From the above table, the rate of feeding can be determined. For example the washer shown in Fig. 2 has an acid tank of the following dimensions: 3' 8" x 14' x 11½", the washing capacity of which is 120 bushels per hour when the fruit remains in contact with the wash solution 2½ minutes. In order to obtain uniform washing, the fruit must not be fed into the washer at a faster rate than 2 bushels per minute.

An excellent check on the rate at which fruit is feeding into the washer is made possible by marking the rear submerger. In this manner, the number of revolutions per minute may be easily counted and the rate of feeding determined. The strength of the acid wash solution should be tested four times daily.

Determining Strength of Acid Solution

The equipment necessary for determining the acid concentration is as follows: one 10-cc. volumetric pipette, one 10-cc. measuring pipette graduated in 0.1-cc., two jelly tumblers and a standard sodium bicarbonate titrating solution.

The titrating solution may be obtained from a reliable druggist. The druggist should be instructed to weigh the sodium bicarbonate accurately and to make a volume accurately as follows: 23 grams of sodium bicarbonate made up to 1 liter with tap water and enough methyl orange crystals to give solution to a deep orange color.

To determine the strength of the acid, a tumbler of the acid solution is drawn from the acid tank. The volumetric pipette is filled by suction from the solution sampled, the excess acid being permitted to flow out until the level of the liquid column is even with the mark on the upper part of the pipette. The measured acid solution is allowed to drain into the second jelly tumbler. Fill the graduated measuring pipette with the sodium bicarbonate solution and adjust the level of the liquid in the pipette to the .00. cc. mark. Allow the solution to flow slowly into the measured acid, while gently shaking the tumbler or stirring the acid with a glass or wooden rod. As soon as the color changes from red to yellow, note the number of cubic centimeters (cc.) of sodium bicarbonate used. This will indicate directly the percentage of acid strength. For example, if 9 cc. of the sodium bicarbonate were required to neutralize 10 cc. of the acid, the strength of the acid would be 0.9 per cent. This approximate strength is obtained where the acid solution contains 3 gallons of 20 degree Baume hydrochloric acid to each 100 gallons of water.

MORE PULL

Trials of wheel tractors equipped with low pressure rubber tires are showing some interesting things. There is less vibration in the rubber tired tractor, giving more comfort to the operator, and longer life to the machine. On stony land there may be as much as 20% more drawing power, as compared to steel cleated wheels. On muddy or snowy fields, cleats pack with soil or snow and lose driving power. Rubber tires do not pack, and if special chains are used, the chains slip enough to keep tires cleaned.

Cornell Experiment Station is testing 11¼" diameter tires, using 9 pounds of air pressure, as a possibility of year-round use of tractors. Michigan investigators found that tires permitted more use of high gear in farm and orchard operations.

Reporting in July, 1933, Mr. E. C. Suave of Michigan Station stated that at that time, the average cost of pneumatic tires and wheels, exclusive of weights for a 2-plow tractor was \$230 for a change over, and \$130 on new tractors. For wheel type tractors, rubber tires seem to be the coming thing, but before changing, we should figure closely on costs and advantages.

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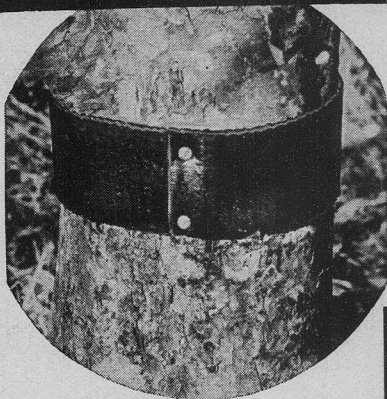
- It is the only nitrogen fertilizer that carries hydrated lime to sweeten the soil.

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Get in touch with your State Experiment Station for band size recommended for your locality. And order from your local manufacturer a supply of BETA NAPHTHOL Tree Bands sufficient for your needs.

Write for descriptive leaflet and
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is a summer oil that has distinct advantages over any other oil. It may be used immediately before or after lime sulfur. It brushes off readily. It costs less than any other summer oil. Summer Scalecide and Nicotine are most compatible.

SUMMER SCALECIDE

holds the effectiveness of Nicotine for a period of 8 to 10 days. It also adds greatly to its penetrating value. Use 1 gallon Summer Scalecide and 1 pound Black Leaf 40 to the 100 for your second brood Codling Moth spray, making two applications not more than 10 days apart.

SUMMER SCALECIDE

also aids in the control of other insects present at that time, such as aphids, leaf hopper, red mite, bag worm or scale.

For those prepared to wash their fruit use Summer Scalecide 1 to 100 with Arsenate of Lead for greatly increased Codling Moth kill. Summer Scalecide brushes off readily.

When using Bordeaux always add 1 gallon of Summer Scalecide to the 100. It makes the finest Bordeaux known.

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